DDH 158.


Co-ords 5300W, 2705S

Drilled for: AUSTRALIAN DEVELOPMENT, NO LIABILITY, Tennant Creek.

Drilled by: GLINDEMANN & KITCHING ENTERPRISES

DATE: May - August, 1961

DEPTH: 1305½ feet

BEARING: 180 degrees

DIP: Collar -68°, 100 -68½°, 200' -67½°, 300 -56°, 400 -56², 500 -60°, 600 -60°, 700 -56°, 800 -54°, 900 -52°, 1000 -50°, 1100 -47½, 1200 -46° (acid tests only)

CORE SIZE: EX to 315'; AX 315 - 1305½'.

CASING: EX - 207'; AX 316'.

FORMATION:

<table>
<thead>
<tr>
<th>Depth (feet)</th>
<th>(Core Recov.)</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>FROM TO</td>
<td></td>
<td></td>
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<tr>
<td>0 70?</td>
<td></td>
<td>Not known</td>
</tr>
<tr>
<td>70? 80?</td>
<td></td>
<td>3&quot; of core of Quartzitic type.</td>
</tr>
<tr>
<td>80? 224' (2')</td>
<td></td>
<td>Biotite Felspar Gneiss, oxidized yellow brown colour. 3 large quartz fragments in core after 89'.</td>
</tr>
<tr>
<td>224 308 (61)</td>
<td></td>
<td>Garnetiferous Biotite Gneiss dark grey in colour except for some red oxidation which gradually lessens from 224 – 272. Main constituents biotite, then felspar and quartz mainly as bands, stringers, lenses and porphyroblasts which impart the gneissic structure. Garnet somewhat variable content ranging from a few narrow bands which are almost devoid of it to 20%. Garnets are pink in colour and up to ⅛&quot; dia. 276 – 300 richly garnetif.</td>
</tr>
</tbody>
</table>
DDH 158 continued.

<table>
<thead>
<tr>
<th>FROM</th>
<th>TO</th>
<th>(Core Rec)</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| 308  | 367  | (51)       | **Gneissosity**  
|      |      |            | 224 - 225 35° to core axis  
|      |      |            | 225 - 234 25° to core axis  
|      |      |            | 234 - 290 35° average core axis  
|      |      |            | 283 - 284 drag 35°, 5°, 35°  
|      |      |            | 290 - 292 10° to core axis  
|      |      |            | 292 - 308 Average 35° to core |

**Mineralization**

273 - 274  
285 - 287  

274 - 275) 1 - 2% Disseminated pyrite  

308 - 367 Garnetiferous Biotite Felspar Gneiss - grey to greenish grey in colour, medium to coarse grained, mottled pink with felspar and quartz in veins and lenses up to 1" wide.  

Pink garnets abundantly disseminated throughout up to 1 mm. diam. Total garnet content up to 10%.  

322 - 360 slightly sericitized giving a wispy appearance.  

362 2" pegmatitic and actinolitic band.

**Gneissosity**

308 - 320 30° to core axis  

320 - 360 20° - 25 to core axis  

**Biotite Gneiss** - slightly greenish dark grey fine-medium grained. Somewhat silicified and felspathized throughout (salmon pink and pink felspars). Garnets up to 1% in several bands only.  

382 - 383  
384 - 385 Coarsely actinolitic and pegmatitic
FROM TO (Core Rec) DESCRIPTIONS

393 1/" vein of epidote associated with pink felspar pegmatite vein.
398 - 408 1/2
425 - 426 } SLIGHTLY SERICITIC
436 - 439 }
403 - 403 1/2 ) Salmon pink felspar quartz peg.
430 - 430 1/2 } conformable with gneissosity.
409 1/2 - 410 reddish pink felspar peg. and some epidote.
422 - 424 ) Generally felspathized in bands
427 - 428 ) with red-pink felspar and some epidote.
Gneissosity averages 28° to core axis.

Mineralization
408 - 409 2-3% disseminated pyrite.
423' up to 1" seam and veins of fine grained basis intrusive (?) containing up to 1/2" wide crystal of chalcopyrite and pyrrhotite.

Felspar Chlorite Porphyry - dark green in colour, fine grained and abundant red-pink porphyroblasts (?) of felspar up to 1/4" diam.
Felspar constitutes 10% of rock. Somewhat gneissose in part.
439 - 442 Gneissic due to bands of felspar and quartz.
440 - 441 Pegmatized with red-pink felspar and quartz, containing sulphides.

Mineralization
440 1/2 Chalcopyrite and Pyrrhotite as one lens
1 1/4" x 1/4" and several scattered crystals.
456 1/2" seam of 15" pyrite.
DDH 158 continued

FROM  TO  (Core Rec.)  DESCRIPTIONS

452\(\frac{1}{2}\)  467  (4\(\frac{1}{2}\))  Quartz Felspar and Biotite Gneiss, grey to pinkish colour, medium to coarse grained. About equal proportions of all minerals. Gneissority 28° at 462\(\frac{1}{2}\) increasing to 45° at 467.

Mineralization

5 - 10% magnetite disseminated throughout. Biotite Gneiss, dark greenish grey in colour, fine-medium grained. Slightly garniferous, variable from 1-3%. Same drag folding. Mineral content mainly biotite and felspar with some quartz. Some silification and salmon pink felspathization in patches.

467 - 488 Pink Syenite Gneiss, fine-medium grained, conformable with general gneissority.

Gneissority

467 - 471 45° to core axis
471 - 488 25° to core axis
488 - 494 15° to core axis

Garniferous Quartz-Actindite(Chlorite)

Magnetite Gneiss ("Iron Formation"). Gneissority largely results from well banded quartz variable in width from stringers up to 2". About 10% pink garnets mainly in mafic bands, finely disseminated or up to 1/2 diam. Magnetite 5-10% of rock. Gneissosity averages 12° to core axis but somewhat undulating.

Mineralization

494 - 499 1-2% pyrite, pyrrh, and some chalco disseminated in mafic 503 - 508 bands.
**DMH 158 continued**

**FROM**

<table>
<thead>
<tr>
<th>FROM</th>
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<th>DESCRIPTIONS</th>
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<tbody>
<tr>
<td>519</td>
<td>522(\frac{1}{2})</td>
<td>(2(\frac{1}{2}))</td>
<td>Biotite Schist, dark greenish grey colour fine-medium grained, comprising mainly biotite (chloritized) with lesser felspar 1 - 2% finely disseminated garnets. Only slightly banded due to sparse quartz felspar stringers.</td>
</tr>
<tr>
<td>522(\frac{1}{2})</td>
<td>546</td>
<td>(24)</td>
<td>Biotite Gneiss same general description as 457 - 494.</td>
</tr>
<tr>
<td>546</td>
<td>593</td>
<td>(50)</td>
<td>Calcite vein. Gneissosity generally undulating and slightly folded. 522(\frac{1}{2}) - 525, 30° to core axis 525 - 546 generally parallel to core axis Garnetif. Quartz Actinolite (Chlorite) Magnetite Gneiss (&quot;Iron Formation&quot;). Generally similar to 494 - 519. 546 - 553 Fine-medium grained with 5-20% finely disseminated garnets and 5% magnetite. 553 - 584 Coarse grained and coarsely banded with average of 10% coarse garnets in mafic bands. Magnetite only minor. 584 - 589 Medium grained and very dark green, 10% magnetite. 589 - 598 Fine-Medium grained, much less banded and very little garnet. Magnetite content 10 -15%. 594, 2&quot; wide pink felspar quartz pegmatite Gneissosity 552 - 567 undulating and gen. parallel to core axis.</td>
</tr>
</tbody>
</table>
DDH 158 continued

FROM  TO  (Core Rec.)  DESCRIPTIONS

546  598  (cont'd)  557 - 579 Average 35° to core axis
579 - 585 Grad. increases from 55° to 75°.  
590 - 592 65° to core axis
595 - 597 75° - 90° to core axis
597½ - 598 45° to core axis.

Mineralization.

557 - 559, 1-2% sulphides mainly pyrrh. pyr. and a little chalcopyrite as disseminations and veinlets.
559½, small patch (1 sq. in.) mainly pyrrh. pyr., and trace chalco.
559½ - 559½, 5% sulphides mainly pyrrh., pyrrh. and trace chalco.
562 - 563½ 1-2% sulphides, mainly pyrrh., 564 - 564½ pyr., and trace chalco.
580½-581, 2 seams up to ½" wide of 2-3% sulphides mainly pyrrh., pyr., and trace chalco.

Garnetif. Quartz Felspar Biotite (Chlorite)

Gneiss. Dark grey in colour, medium grained. Somewhat banded due to quartz, and pink felspar stringers and lenses. Biotite much chloritized. 5-10% garnets. In more siliceous sections, garnet is very finely disseminated along mafic bands. Notably magnetic due to 5-10% magnetite.

598 - 599 largely coarse pink felspar and quartz pegmatite.

Gneissosity undulating but averages 25° to core axis.
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<tr>
<th>FROM</th>
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<th>(Core Feet)</th>
<th>DESCRIPTIONS</th>
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<tbody>
<tr>
<td>611</td>
<td>645</td>
<td>(34)</td>
<td><strong>Pink Syenite Gneiss</strong> — medium grained and slightly gneissic at 40° to core axis. Grey altered bands 1&quot; - 2&quot; wide along several joint planes.</td>
</tr>
<tr>
<td>645</td>
<td>686</td>
<td>(4)</td>
<td><strong>Quartz Felspar Gneiss</strong>, grey, medium to coarse grained, Generally banded due to quartz and pink felspar bands, stringers and lenses up to 1&quot; wide. Garnet content variable from 2% - 5% and mostly finely disseminated. Notably magnetic due to 2-5% and occasionally more magnetite disseminated or concentrated along narrow bands. 645 - 646, pink Syenite Gneiss, contacts crosscutting. Gneissosity somewhat variable due to contortion and undulation. 645 - 672 Average 39° to core axis. 672 - 686 Average 55° to core axis.</td>
</tr>
<tr>
<td>686</td>
<td>696</td>
<td>(10)</td>
<td><strong>Garnetiferous Quartz Actinolite (Chlorite) Magnetite Gneiss</strong> (&quot;Iron Formation&quot;). Dark greenish, med-coarse grained and well banded with quartz bands up to 1&quot; wide. Mostly only weakly magnetic in sections only (1-2% magnetite) Gneissosity 686 - 691, 70° to core axis 691 - 696, 50° to core axis 695 - 696, faulted and fractured at contact with syenite.</td>
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DDH 158 continued

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<tr>
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<th>(Core Req.)</th>
<th>DESCRIPTIONS</th>
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</thead>
<tbody>
<tr>
<td>696</td>
<td>705</td>
<td>(83)</td>
<td>Pink Syenite Gneiss as before but only slightly gneissic. Contains some grey xenoliths.</td>
</tr>
<tr>
<td>705</td>
<td>820</td>
<td>(111)</td>
<td>Garnetif Quartz Actinolite Chlorite (Biotite Gneiss). Somewhat similar to &quot;Iron Formation type but less banded quartz and magnetite in a few sections only. Dark greenish in colour, med-coarse grained. 5-15% mainly coarse pink garnet.</td>
</tr>
</tbody>
</table>

705 - 711 Very siliceous and quartz banded.
722 - 729 Biotite (Chlorite) Felspar Gneiss. Small garnets a very minor constituent.
Dark and light bands - dark mainly biotite, light include felspar, qtz,chlorite and actinolite.

752 - 762 Very little garnet
762\ 1/4 - 763 Quartz, white felspar, Pegmatite.
782 - 795 less garnet and finely disseminated
795 - 900 Q.P.B. Gneiss, grey, med.grained.
778 - 783 Medium to strongly magnetic due to 2 - 10% magnetite.

811\ 1/4 - 813 White -Pink Syenite (upper contact 45° and lower 15° to core axis).

Gneissosity conspicuous due to banding.

705 - 740 Average 35° to core axis
740 - 745 Average 50° to core axis
745 - 762 Average 70° to core axis
762 - 767 Average 35° to core axis
767 - 777 Average 60° to core axis
777 - 780, 50° - 60° (dragfolded)

780 - 811\ 1/4, 45° except dragfold at 807 with dip thereafter in opposite direction.

Suggest west pitch if E-W strike.
813 - 820, Average 60° to core axis.
Mineralization

703 - 709½, 2-5% sulphides mainly pyrite, pyrrhotite and trace chalcopyrite.
711, 1" wide band with 5% pyrrhotite and a little chalco, also magnetite.
716½, ½" wide band 10% pyrite.
717 - 722, 1-2% finely disseminated pyrrh., pyrite, and trace chalco. Several ½" bands richer.
756 - 759 2-3% finely disseminated pyr., pyrrhotite, and trace chalco.
769 - 770½ 1" wide seen 15% pyrrhotite at 770°.
778 - 779½ several 1" - 2" wide bands with 2 - 3% pyrrhotite, and a little chalco.
799 - 799½, 7-10% pyrrhotite, pyrite and less than 1% chalco.
799½ - 801 2-5% pyrrhotite, pyrite, and trace.
801½ - 802 chalco, finely disseminated.

820 838 (18)
Pink Syenite as before but very little gneissosity.

822 - 823 coarse pink felspar-quartz pegmatite
828 - 830 altered inlier of 705 - 820 type.

Garnetif Quartz Chlorite Magnetite Gneiss
("Iron Formation"). Similar to previously but only partly actinolitic. Garnet content variable from 2 - 10%. Magnetite content variable. Some sections negligible but
343 - 344½ heavily magnetic.

Gneissosity (banding)
338 - 340, 25° to core axis
340 - 343, parallel to core axis
343 - 349, 45° to core axis
349 - 350 dragfolded
 Mineralization

849½, 2" band containing several seams of pyrrhotite and chalcopyrite in a dragfold.

Quartz Felspar Biotite Schist, grey in colour, fine - medium grained.

850 - 851, dark grey, sheared (?) and some pinkish jasper veins. Schistosity 60 - 70° to core axis.

Garnetiferous Quartz Felspar Biotite Gneiss.

Grey, fine-medium grained and very siliceous. Biotite mostly a brony colour. 2-10% very finely disseminated light pink garnet mostly concentrated along bands. Mostly finely banded, with garnet concentration often a centuating banding. Contorted and folded in part.

889 - 890½, some chloritic and actinolitic content.

Gneissosity

864 - 875, 60° to core axis
875 - 881, contorted and drag folded
881 - 890½, 60° to core axis.

Mineralization

864½ - 866  
867 - 872  
873 - 874  
875 - 889, 5-10% pyrrhotite, some pyrite and trace chalcopyrite finely disseminated and in seams tracing out certain beds and in crests of drag folds.
<table>
<thead>
<tr>
<th>FROM TO (Core Rec.)</th>
<th>DESCRIPTIONS</th>
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<tbody>
<tr>
<td>89010 899 (3¼)</td>
<td><strong>Garnetif Quartz Actinolite (Chlorite)</strong></td>
</tr>
<tr>
<td></td>
<td>Magnetite Gneiss (&quot;Iron Formation&quot;).</td>
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<tr>
<td></td>
<td>Quartz bands not as prominent as previously</td>
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<tr>
<td></td>
<td>otherwise similar. Gneissosity averages 60°</td>
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<td></td>
<td>to core axis, some slight drag folding.</td>
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<tr>
<td></td>
<td><strong>Mineralization.</strong></td>
</tr>
<tr>
<td></td>
<td>894 - 897, 2 -5% pyrrhotite, pyrite, trace</td>
</tr>
<tr>
<td></td>
<td>chalcopyrite.</td>
</tr>
<tr>
<td>899 905 (5½)</td>
<td><strong>Quartz Felspar Biotite Gneiss</strong>, gray to dark</td>
</tr>
<tr>
<td></td>
<td>grey, fine-medium grained. Partly magnetic.</td>
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<tr>
<td></td>
<td>Mainly pinkish felspar. 2-5% finely disseminated garnet.</td>
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<tr>
<td>905 1028 (112)</td>
<td><strong>Garnetiferous Quartz Actinolite (Chlorite)</strong></td>
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<tr>
<td></td>
<td>Gneiss.</td>
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<tr>
<td></td>
<td>Grey green in colour, medium to coarse</td>
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<tr>
<td></td>
<td>grained and generally fairly well banded.</td>
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<tr>
<td></td>
<td>Garnet contents variable from 2-10%, mostly</td>
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<tr>
<td></td>
<td>finely disseminated, occasionally coarse</td>
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<tr>
<td></td>
<td>crystals.</td>
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<tr>
<td></td>
<td>905 - 913 strongly magnetitic in bands</td>
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<tr>
<td></td>
<td>905 - 910 foliated</td>
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<tr>
<td></td>
<td>913 - 918¼ mainly chlorite or chloritized</td>
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<tr>
<td></td>
<td>actinolite and a one foot section (915-916)</td>
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<tr>
<td></td>
<td>heavily biotitic.</td>
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<tr>
<td></td>
<td>916 - 917 Pegmatized</td>
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<tr>
<td></td>
<td>932 - 933 Quartz, white felspar pegmatite.</td>
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<tr>
<td></td>
<td>959 - 970 finely banded and puckered.</td>
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<tr>
<td></td>
<td>Slightly pinkish due to finely disseminated</td>
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<tr>
<td></td>
<td>garnets.</td>
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<tr>
<td></td>
<td>993 - 994 white-pink quartz-felspar pegmatite</td>
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<tr>
<td></td>
<td>995 - 1000 &quot;Iron Formation&quot;, strongly magnetitic in bands.</td>
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<tr>
<td></td>
<td>987 - 996, Q.F.B. Schist mainly.</td>
</tr>
</tbody>
</table>
FROM TO (Core Rec.) DESCRIPTIONS.

1021 1/4-1023 1/4 Quartz, white felspar Peg.  
Gneissosity.  
905 - 913, 65° to core axis  
913 - 916, 75° to core axis  
917 - 924, 35° at 917, then to normal drag  
fold at 920. Thereafter banding at 65° on a  
strike at right angles to that earlier.  
925 - 928, undulating parallel to core axis  
928 - 931, 60° to core axis  
931 - 938 1/4, undulating parallel to core  
938 1/4-945, 45° to core axis  
945 - 953, undulating but average 25° to core  
953 - 960, 40° to core axis  
960 - 980, successive normal dragfolds but  
overall approximately parallel to core.  
980 - 1000, 40° to core axis  
1000 -1023, 60° to core axis  

Mineralization  
920 - 921, 2-5% pyrrhotite, some chalcopyrite  
921 - 924, 2% pyrrhotite, trace chalco.  
925 1/4, 1" seam 15% disseminated pyrrhotite,  
trace chalco.  
935 - 938, 2 -5% pybhr., pyrite and up to  
1% chalco (over 2" at 936 1/4).  
939 1/4-940 1/4, 2-5% pyrhh., trace chalco.  
940 1/4-943, 2% pyrhh., trace chalco.  
953 -954, 2-5% pyrhh., pyrite, Also magnetite  
978, 2" with 3% pyrhh., 1% chalco (mainly  
concentrated along a fracture plane.  
Associated quartz near a 1" wide peg. vein.  
991 1/4 - 992, 5% pyrite, pyrhh., and trace chal  
Pyrite commonly outlining edges of chalrite  
patches.
DDH 158 continued

FROM TO (Core Req.) DESCRIPTIONS

1027 - 1028, 2¾ pyrite and pyrrhotite.

1028-1059 (29½) Amphibolitic Biotite Schist, grey to dark greenish grey, fine-medium grained.

1028-1033, 2-5½ garnets

1037½-1038½, quartz, white felspar pegmatite

1034-1059, considerable felspathization or pegmatization (quartz white plagioclax) to varying degree. In more intensely pegmatized bands, bronze biotite also prominent.

1059-1090 (30½) Quartz Felspar Biotite Gneiss, grey, fine to medium grained and finely banded due mainly to felspathization and quartz veining.

Gneissosity averages 65° to core axis. Normal drag fold at 1066½°.

1090-1094½ (3½) Amphibolite. Dark grey to black, fine-medium grained.

Mineralization

1092, ½" square patch of pyrrhotite with a little chalcopyrite associated with patch of quartz.

1094½-1102½ (8') Brolite (Actinolite ?) Schist. Grey medium grained. Many stringers and two veins (up to½" wide) of quartz and felspar (some affervescent). Schistosity 45° to core axis.

Mineralization

Sparse pyrite and pyrrhotite associated mainly with stringers and veins mentioned above.
Garnetiferous Biotite Felspar Gneiss, grey medium to coarse grained. Garnet content variable but up to 7% (mostly fine-medium size). Generally somewhat felspathized (coarse grained types) or containing stringers and veins of quartz-white felspar.

1105½ - 1107½ garnetifer quartz actinolite

1117 - 1118 (chlorite) Gneiss.

1120 - 1126 Biotite (chlorite) Felspar schist.

1122½, up to 1" wide Quartz white Felspar Pegmatite.

Gneissosity

1102 - 1109, 45° to core axis
1109 - 1130, 55° to core axis
1130 - 1135, undulating mainly parallel to core axis.

Mineralization.

1117 - 1118, 5-10% mainly pyrrh., some pyr. and trace chalcopyrite.

Quartz Felspar Actinolite Biotite Schist

Light grey green in colour, fine-medium grained. Several bands and many stringers of quartz felspar.

1140 - 1143 Garnetif "C(chl.) Act.Gneiss

1151 - 1162½ Garnetif - Biotite Gneiss.

Schistosity and gneissosity 60° to core axis.

Mineralization

1140 - 1143 up to 3% pyrrh. and some pyrite.
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<tr>
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<tbody>
<tr>
<td>1162(\frac{1}{2})</td>
<td>1183</td>
<td>(17(\frac{1}{2}))</td>
<td>Amphibolite Schist, dark green black, medium grained. Schistosity 55° to core axis. Several stringers of quartz-white felspar.</td>
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<td>1178 - 1179 Quartz-white felspar pegmatite.</td>
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<td></td>
<td>Mineralization.</td>
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<td>Scattered pyrrhotite and trace chalcopyrite in stringers of Q.F. pegmatite.</td>
</tr>
<tr>
<td>1183</td>
<td>1188(\frac{1}{2})</td>
<td>(4(\frac{1}{2}))</td>
<td>Garnetiferous Quartz Felspar Biotite (Chlorite) Actinolite Gneiss. Up to 5% garnets. Grey, medium grained, somewhat felspathized.</td>
</tr>
<tr>
<td>1188(\frac{1}{2})</td>
<td>1195(\frac{1}{2})</td>
<td>(7)</td>
<td>Biotite Gneiss, grey medium grained</td>
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<td>1188(\frac{1}{2}) - 1192(\frac{1}{2}) well pegmatized with Quartz-white felspar.</td>
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<td>1193 - 1195(\frac{1}{2}) some garnets.</td>
</tr>
<tr>
<td>1195(\frac{1}{2})</td>
<td>1202</td>
<td>(4(\frac{1}{2}))</td>
<td>Biotite Amphibolite Gneiss, dark greenish in colour, medium grained. Fairly well banded. Some stringers and veins of quartz and felspar.</td>
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<td>1196 - 1196(\frac{1}{2}) garnetifer &quot;Iron Formation&quot; type.</td>
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<td>Mineralization</td>
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<td></td>
<td>1196 - 1196(\frac{1}{2}), 3% sulphides mainly chalcopyrite and some pyrrhotite (1% Cu.)</td>
</tr>
<tr>
<td>1202</td>
<td>1227</td>
<td>(25)</td>
<td>Amphibolite dark grey and coarse grained. Amphibole mostly very elongated ((\frac{1}{2}&quot;). Partly biotitic (bronzey) and schistose.</td>
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<tr>
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<td></td>
<td>1223(\frac{1}{2}) - 1225(\frac{1}{2}) Quartz - white Felspar pegmatite</td>
</tr>
</tbody>
</table>
1227 1305\(\frac{1}{2}\) (71) Piorite; very dark grey, medium coarse grained. At least 5% magnetite content. 1228\(\frac{1}{2}\) - 1229 Quartz white felspar. Peg. Mineralization Occasional minor disseminations of pyrite and pyrrhotite.

END OF HOLE.
DDH 161

LOCATION: B.M.R.3 Reserve (A to P 844), 19 miles W.S.W. of Tennant Creek. Co-ords 20500W, 4350N.

BEARING: 360°


DEPTH: 722\(\frac{1}{2}\) feet

CORE SIZE: NX to 165\(\frac{1}{2}\)', BX to 250\(\frac{1}{2}\)', AXT to 722\(\frac{1}{2}\)' (except 341 - 434 AXWL).

CASING: (all recovered at completion of hole). NX to 112', BX to 165\(\frac{1}{2}\)', AXT to 251'.

DRILLED FOR: Australian Development, No Liability, Tennant Creek.

DRILLED BY: Glindemann & Kitching Enterprises, Mount Isa.


FORMATION:

<table>
<thead>
<tr>
<th>Depth feet</th>
<th>FROM</th>
<th>TO</th>
<th>Core Rec.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>76</td>
<td></td>
<td></td>
<td>Sludges only - Probably semi consolidated felspathic sandstone, somewhat argillaceous.</td>
</tr>
<tr>
<td>76</td>
<td>108</td>
<td>10'</td>
<td></td>
<td>Laterite (old land surface?). Comprises consolidated somewhat argillaceous sands and grits largely red brown and lateritized partly light grey and leached.</td>
</tr>
<tr>
<td>108</td>
<td>160</td>
<td>(3')</td>
<td></td>
<td>UNCONFORMITY</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1. Upper portion sludges only comprising mainly quartz (some large pieces qtz. stringer?) and felspar.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2. Core in lower section</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(a) 1 foot very limonitic coloured granitic? type schist.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(b) 2 feet pale green-yellow kaolinitic rock with some quartz stringers.</td>
</tr>
<tr>
<td>160</td>
<td>176</td>
<td>13'</td>
<td></td>
<td>Biotite Felspar Schist - grey (mainly unoxidized) to light brown grey (oxidized) fine grained. Schistosity at 30° to core axis.</td>
</tr>
<tr>
<td>176</td>
<td>206</td>
<td>26'</td>
<td></td>
<td>Felspar Muscovite Schist. Cream coloured fine-medium grained. Probably largely an altered, felspathized version of 160 - 176. Slightly schistosity at 30° to core axis. 180 - 190 Stringers and veins up to (\frac{3}{8})&quot; wide filled with Fe and Mn oxides.</td>
</tr>
</tbody>
</table>
FROM  TO  Core Rec.  DESCRIPTION

225  243  8'  Biotite Gneiss. Grey to light brown, partially oxidized and very friable. Coarsely grained and banded. Some banding due to quartz-felspar veining gneissose 10 - 20 to core axis.

243  250  3'  Quartz Felspar Biotite Gneiss. Grey to pinkish (Felspar) in colour, very siliceous and felspathic.
Mineralization 249 - 250 garnetiferous (5%).

250  360  78'  Garnetic Chlorite Actinolite Quartz Gneiss, dark greenish in colour, fine-medium grained. Pink garnet content variable but up to 7% and up to 1/4" diam. Gneissose mainly due to quartz occurring in bands, stringers and lenses. Quartz content variable from 15 - 60%. The more rigid quartz injected sections often somewhat sheared and fractured. Possibly some graphite in sections.
Mineralization 250 - 262 not garnetic
267 - 272 1/2 chloride - biotite felspar schist.
283 1/2-296 similar to 267-272 1/2, but containing more stringers of white felspar-quartz along fracturing.
291  1" band mostly P.Q.stringers plus an 1/4" seam of hematite.
Gneissose.
Mineralization 250 - 255 parallel to core axis
255 - 297 30' to core axis
297 - 321 20' to core axis
321 - 360 undulating but generally parallel to core axis.

360  502  147  Garnetiferous Quartz Actinolite Chlorite Gneiss. Generally similar to 250 - 350, but more siliceous. Garnet content variable from zero to 10% and may be finely disseminated up to 1/8" diameter. Quartz veining becomes coarse and up to 1/2" wide from 380 - Quartz veins often have selvedges of actinolite.
410 - 417 fractured (brecciated) and 426 1/2 - 431 felspathized with pink felspar.

356 - 376 partly hematized or oxidized 438 - 442 actinolitic sections (plus tourmaline at 438')

472 - 496 considerable amount of microgranite injection.
491 - 494 sheared chloritic schist
496 - 498}
<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Core Rec.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>502</td>
<td>524½</td>
<td>21</td>
<td>Gneissosity. (Banding) 360 - 420 undulating but generally parallel to core axis. 420 - 452 approx. 10° to core axis, but variable. 452 - 472 undulating up to 15° to core axis. 497 - 501 45° to core axis (schistosity) Mineralization. 368 - 380 2-3% pyrite in stringers along banding. 383½-384 1&quot; seam of quartz hematite and some pyrite. 394 1&quot; seam of quartz and hematite 410 - 412 5% pyrite. 415 - 416 3-5% pyrite mainly associated with hematite veins up to 4&quot; wide. 423½-425½ 1-3% pyrite along banding. 477 - 478 3% pyrite, preferentially deposited along gneissosity, plus variable graphite content (up to 10%). Pink Micro Granite, Equivalent to type called syenite in DDR 156.</td>
</tr>
<tr>
<td>524½</td>
<td>562</td>
<td>38</td>
<td>Quartz Actinolite Chlorite Gneiss, partly garnetiferous from 544 - 563. Coarsely banded, some quartz bands up to 3&quot; wide. 524½ - 530½ somewhat fractured and felspathized. 540 - 546) Actinolite chlorite biotite 553 - 555) Schist—some felsapar. Slight folded and drag folded. Mineralization. 545 - 551 2-5% pyrite 551 - 552 10% pyrite and limonitic patches. 556 1&quot; 10% pyrite</td>
</tr>
<tr>
<td>562</td>
<td>722½</td>
<td>159</td>
<td>Garnet Quartz Biotite Magnetite Amphibole Gneiss. Grey fine-medium grained, some segregation of siliceous and mafic constituents giving a banded appearance. Overall magnetite content probably 10%, but narrow bands higher. Garnet content very variable but up to 15%. 593 - 616) slight pink pegmatization. 671 - 690) 702 - 703) Approximately last 10 feet were hematitic and virtually non magnetic. Gneissosity. 563 - 570 generally about 10° to core axis 570 - 575 parallel to core axis 575 - 615 average 30° to core axis 615 - 690 undulating but generally parallel to core axis. 690 - 722½ 15° to core axis. Mineralization. 697 4&quot; wide fracture vein containing 10% pyrite.</td>
</tr>
</tbody>
</table>

--- END OF HOLE ---
The discovery was made by two prospectors who found that
the quartz-hematite ore had radioactivity about 30% normal background.
In a specimen of later shown to me by the Manager of Western Nuclear (Act.) Ltd.,
radium is clearly visible in joint faces.
In October–November, 1957 the National Lead Company drilled D.D.H.-G.F. 11 on a geochemical-magnetic anomaly at the 'Golden Forty North' prospect (fig. 1), 4,000 feet east of the Golden Forty Mine. The hole was designed to test the ground between the two magnetic highs and the geochemical anomaly. The Bureau's geochemical party processed 23 samples of the drill core. The hole failed to find mineralization. (see drill log attached).

Reanalysis of this prospect in the light of the core sample values, consideration of the geologic structure, and the overall conclusions of the geochemical work by the Bureau (McMillan and Delman, 1961), shows that D.D.H. 11 has not satisfactorily tested this prospect. The principal factors arising from this analysis are:

1. Drill core values cut out sharply at about 200 feet depth and the remainder of the hole is in barren ground (fig. 2). A line drawn from the edge of the geochemical profile through the cut out on the drill hole is coincident with the general dip of the bedding in theurremunga Sediments; this suggests a bedding control on the movement of the anomalous copper, in which case a source creboby (if present) can be expected north of the D.D.H. 11.

2. The southernmost magnetic high is probably the depth extension of the Golden Kangeroo ironstone outcrop which gave only low values relative to Poko, Orlando, Cat's Whiskers, North Star, etc. Thus on present appraisal of the geochemical work it is not expected to have copper mineralization associated with it at depth.

3. The northernmost magnetic high may be the extension of the ironstone body centred at 1200N, 360°E. This body gave copper content of 50, 200, and 240 parts per million (p.p.m.) which place it in Group IV of McMillans classification of the ironstone bodies; thus any copper mineralization at depth is more likely to be associated with the body causing this magnetic high.

4. However, the higher copper content of the sediments (up to 800 ppm) compared with the ironstone body and consideration of the results obtained in other parts of the field suggest that the source of the anomalous values in the sediments is not necessarily associated with ironstone - thus a drill hole should be designed to test both possibilities.

5. A prominent linear feature extends from 400 N, 2000 E to 1200 N, 3600 E. (fig. 1). With the general dip to the north any mineralization in this zone at depth would be north of D.D.H. 11.

Thus a D.D.H to test this prospect should be designed to probe the northernmost magnetic body as the principal target, and to pass through the body of the geochemical anomaly both of which lie on the north-dipping linear feature mentioned in 5 above.

On the limited magnetic evidence available a suitable site would be at 1500 N, 3900 E depressed 50° due south (fig. 3).

A second hole should be designed to test the target 250 feet east of the first hole (fig. 2).
The following two diamond drill holes are recommended to test the geochemical magnetic anomaly at the Golden Forty North prospect.

<table>
<thead>
<tr>
<th>D.D.H.</th>
<th>CO-ORDINATES</th>
<th>BEARING</th>
<th>INCLINATION</th>
<th>DEPTH APPROX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAR 1</td>
<td>1800N 3900 E</td>
<td>180°</td>
<td>50°</td>
<td>800 ft.</td>
</tr>
<tr>
<td>BAR 2</td>
<td>1600N 4150 E</td>
<td>180°</td>
<td>45°</td>
<td>700 ft.</td>
</tr>
</tbody>
</table>

Reference